

Abstract

A chaotic communication system employs transmitting and receiving chaotic oscillating circuits. In an embodiment of the invention employing a Chua circuit as the basic chaotic circuit, the transmitter has a tank circuit portion and a Chua diode portion linked through a resistance. The capacitance of the tank circuit is varied by selectively switching in and out of the tank circuit an auxiliary capacitance isolated by an optoisolator. Switching of the optoisolator is controlled by an information signal to generate a perturbed oscillation in the transmitting circuit. A voltage is tapped from the Chua diode circuit and transmitted to carry the information from the information signal. A receiver in another embodiment applies the transmitted signal to both the tank circuit and Chua diode portions of the receiving circuit. The transmitted signal is applied through a resistor to the Chua diode portion as well as the tank circuit portion. By applying the received signal to the Chua diode portion as well as the tank circuit, synchronization of the transmitter with the receiver is accelerated substantially. In still another embodiment, the tank circuit components are varied to generate a vocabulary of chaotic signals that can be decoded by various receiver embodiments that are described.